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Description of a new species of the genus *Fessonia* (Acari: Prostigmata: Smarididae) from Iran

Safoura SALARZEHI[1], Hamidreza HAJIQANBAR[2]*, Ali OLYAIE TORSHIZ[1] & Javad NOEI[1]

[1] Department of Plant Protection, Jahad Daneshgahi Higher Education Institution of Kashmar, Iran.

[2] Department of Entomology, Faculty of Agriculture, Tarbiat Modares University, 14115-336, Tehran, Iran.

*Corresponding author, E-mail: hajiqanbar@modares.ac.ir

Description of a new species of the genus *Fessonia* (Acari: Prostigmata: Smarididae) from Iran. - *Fessonia torshizica* Salarzehi & Hajiqanbar n. sp. is described from larvae collected in the soil of vineyards in northeastern Iran. This is the second species currently known from larvae in the genus *Fessonia*. Some morphological characters of the new species are compared with its only congener, *F. papillosa* (Hermann 1804).

Keywords: Parasitengona - Trombidiformes - Erythraeoidea - larva - *Fessonia torshizica*.

INTRODUCTION

Mites of the cohort Parasitengona (Acari: Trombidiformes) are a large and diverse group of prostigmatic mites distributed worldwide. These mites usually parasitize invertebrates during their larval stage but the deutonymphs and adults are predaceous. The superfamily Erythraeoidea is one of the largest parasitengone superfamilies, consisting of two families: Smarididae and Erythraeidae. The family Smarididae, with 10 genera and 53 species (Zhang *et al.*, 2011), is a relatively small family usually found in grassland and litter or under the bark of trees (Southcott, 1996; Krantz & Walter, 2009).

Mites of the family Smarididae are classified in two subfamilies, Smaridinae and Hirstiosomatinae, the former with five genera including *Fessonia* von Heyden, 1826. This genus is distributed in Europe, Australia, North America, Asia and Africa, and hitherto encompassed 10 known species, nine of which were described from adults. Previously the larval stage of only one species, *F. papillosa* (Hermann 1804) from France, Italy, Croatia, Germany, Greece and Hungary was known (Wohltmann, 2010). During a faunistic survey of mites in vineyards of Kashmar and Torshiz counties (northeastern Iran) in 2010-2011, we found in soil samples larvae of a species of *Fessonia* which is new to science. This is the first record of the genus *Fessonia* from Iran. In the following we describe this new species and compare its morphological characters with those of the larva of *F. papillosa*. We consider it very unlikely that the larvae of the new species are conspecific with adults of any of the previously described *Fessonia* species.

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MATERIALS AND METHODS

The mite specimens were collected from litter and soil samples and extracted by Berlese funnel, then cleared in lactophenol and mounted in Hoyer's medium. The morphology of the specimens was studied with an Olympus BX51 equipped with phase contrast and a drawing tube. All measurements in this description are given in micrometres. In the description, body measurements are given for the holotype and the paratype, the latter in parentheses. Terminology and abbreviations follow those of Grandjean (1947) and Wohltmann (2010).

The holotype of the new species is deposited in the Acarological Collection, Zoological Museum, College of Agriculture, University of Tehran, Karaj, Iran. The paratype is deposited at the Natural History Museum of Geneva, Switzerland.

The following abbreviations are used in the description: ε (famulus) = specialized smooth seta on tarsus of leg I, usually small; ζ (eupathidium) = specialized smooth seta on legs and palp, in particular on tarsus; z (accessory seta) = smaller seta close to dorsal eupathidium on tarsus of leg I; κ (kappa) = microseta on tibia and genu of walking legs; σ (sigma) = solenidion on genu; φ (phi) = solenidion on tibia; ω (omega) = solenidion on tarsus; I = first walking leg; II = second walking leg; III = third walking leg; AL = first pair of non-sensillary setae on scutum in larvae; ASens = first pair of trichobothria on scutum in larvae; as (oral seta) = located anteriorly on gnathosoma; Bf = basifemur; bs (subcapitular seta) = located ventrally on gnathosoma; cs (adoral seta) = usually small smooth pointed setae located dorsally on gnathosoma; Cx (coxa) = epimeral plate; Fe = femur; fn = number of setae; Ge = genu; IP (index pedal) = sum of all lengths of legs; N = non-specialized seta on palp and legs; PL = second pair of non-sensillary setae on scutum in larvae; PSens = second pair of trichobothria on scutum in larvae; Ta = tarsus; Tf = telofemur; Ti = tibia; Tr = trochanter.

SYSTEMATIC ACCOUNT

FAMILY SMARIDIDAE VITZTHUM, 1929

Genus ***Fessonia*** von Heyden, 1826

Fessonia torshizica Salarzehi & Hajiqanbar **n. sp.** Figs 1-7

MATERIAL STUDIED: Holotype larva (SS-2010-1a), free-living, collected from soil samples of vineyards in Torshiz, Khorasan Razavi province, Northeastern Iran, 35° 11' N, 58° 72' E, 1215 m. a.s.l. 24-IX-2010, leg. S. Salarzehi. Paratype: 1 larva (SS-2010-1b), same collection data as for holotype.

ETYMOLOGY: The specific epithet refers to the type locality, Torshiz.

DIAGNOSIS: Tarsus 1 with 26 serrate setae; genu I without microseta (k); genua I, II, and III each with one solenidion (σ); basifemur I and telofemur I with 3 and 4 serrate setae, respectively; tarsus II with 24 serrate setae.

DESCRIPTION OF LARVA: Metric data given in Table 1.

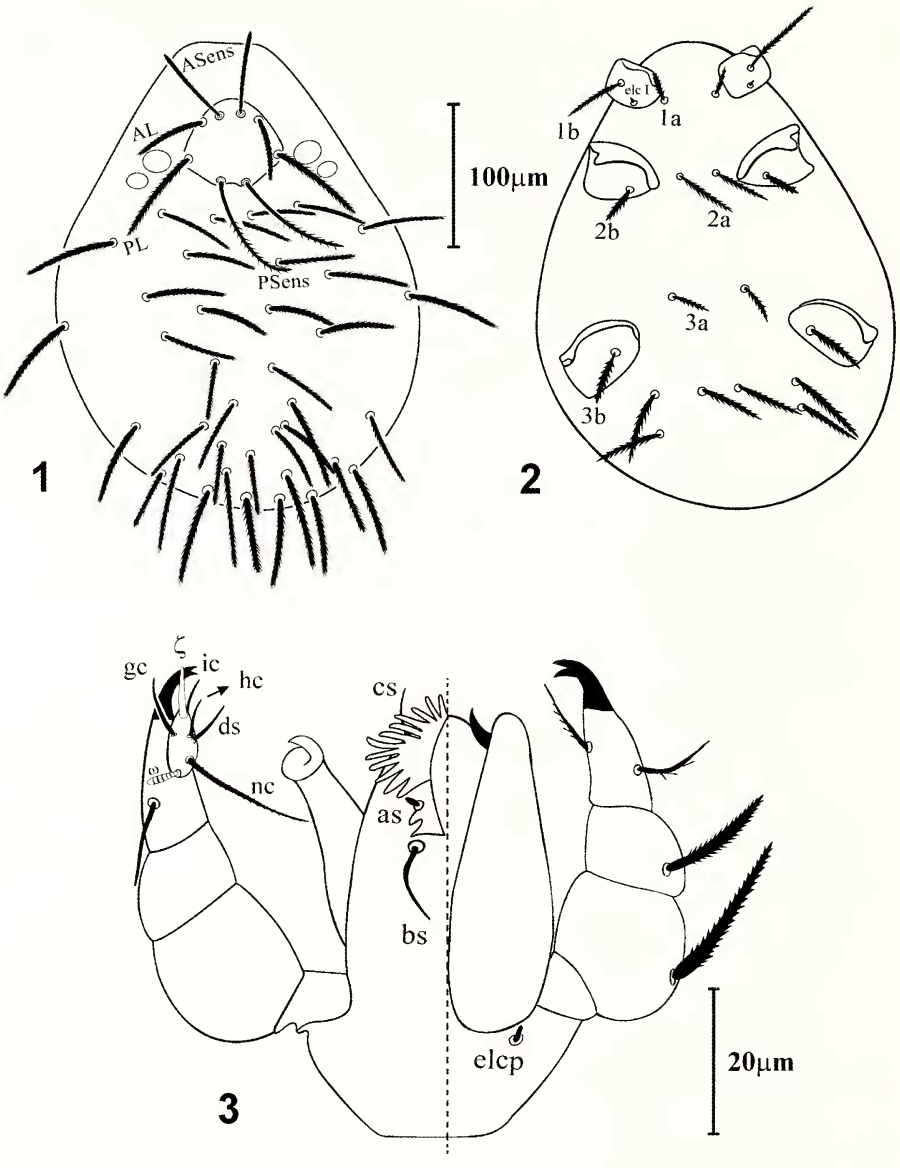
Idiosoma (Figs 1-2). Length 316 (300), width 249 (221). Dorsal scutum subpentagonal, anterior border curved, with two pairs of barbed normal setae (AL, PL), two pairs of trichobothria (ASens, PSens), ASens almost setulose throughout but PSens setulose only in posterior half. Laterally of scutum two pairs of eyes. Remaining part of dorsum carrying 38 barbed setae in rows C-H. Venter with all setae barbed except elc I. Coxa I with setae 1b 52 (49) and 1a 19 (18), setae 1a located outside, close to

TABLE 1. Morphometric data of larvae of *Fessonia torshizica* n. sp.

Character	Holotype	Paratype
Scutum lenght	61	58
Scutum width	65	61
ASens	53	47
ASens-ASens	16	15
PSens	84	77
PSens-PSens	19	18
AL	47	39
AL-AL	44	37
PL	68	61
PL-PL	65	55
Palpal Tr	8	7
Palpal Fe	21	20
Palpal Ge	11	10
Palpal Ti	14	12
Odontus	10	8
Palpal Ta	8	8
Cx I	25	21
Tr I	19	13
Bf I	28	22
Tf I	22	21
Ge I	31	26
Ti I	42	38
Ta I	39	31
Leg I	208	172
Cx II	35	23
Tr II	22	14
Bf II	26	21
Tf II	22	19
Ge II	29	28
Ti II	38	34
Ta II	34	31
Leg II	203	171
Cx III	36	26
Tr III	22	19
Bf III	27	22
Tf III	30	25
Ge III	33	32
Ti III	59	55
Ta III	40	35
Leg III	248	215
IP	659	558

margins of coxae I. Setae 2b 21 (19), situated on coxae II; setae 2a 44 (41), situated between coxae II. Setae 3b 35 (32), situated on coxae III; setae 3a 24 (22), situated anteriorly outside coxae III. Three pairs of setae situated posterior to coxae III.

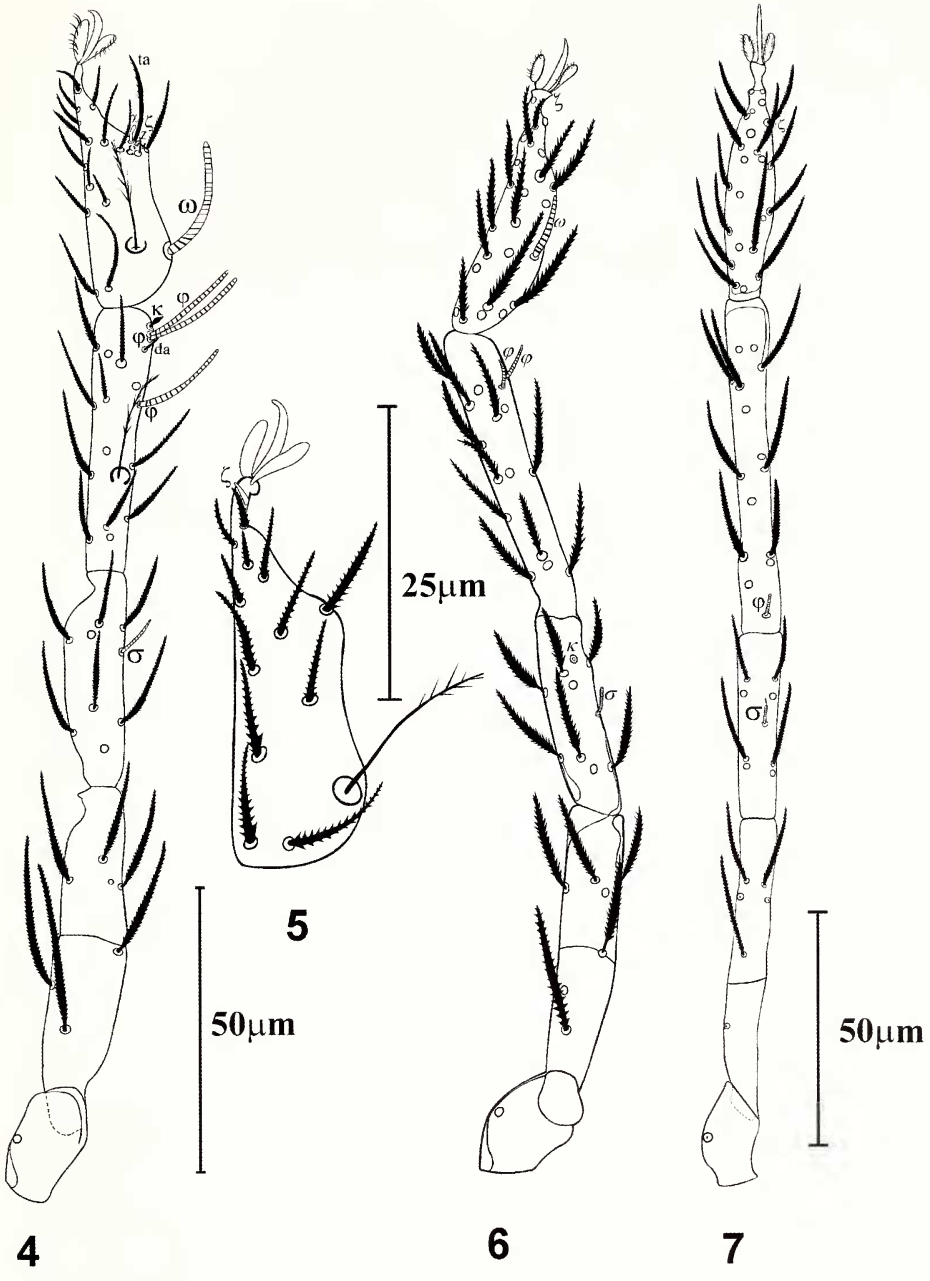
Gnathosoma (Fig. 3). Chelicera with cheliceral base 60 (64) long and with smooth movable claw; cheliceral digits short, 5 (4) long. Dorsal gnathosoma with a pair of smooth, pointed adoral setae *cs* 6 (5) anteriorly and with a pair of short, thick and blunt supracoxal setae *elcp* 3 (2) in lateral position. Ventrally a pair of smooth and pointed subcapitular (tritorostral) setae *bs* 10 (8) and a pair of short, thick and blunt



FIGS 1-3

Fessonia torshizica n. sp., larval holotype. (1) Dorsal view of idiosoma. (2) Ventral view of idiosoma. (3) Dorsal view (right side) and ventral view (left side) of gnathosoma.

oral setae *as* 3 (2). Palpal femur with one barbed dorsal seta, 21 (19) long, palpal genu with one barbed dorsal seta, 11 (9) long. Palpal tibia with one smooth and two barbed setae. Odontus bifid, 9 (7) long. Palpal tarsus with four smooth setae *gc* 7 (6), *ds* 5 (4), *ic* 4 (3), *hc* 3 (2), one barbed seta *nc* 15 (14), one solenidion (ω) and one prominent distal eupathidium (ζ).



FIGS 4-7

Fessonia torshizica n. sp., legs of larval holotype. (4) Dorsal view of entire leg I. (5) Ventral view of tarsus of leg I. (6-7) Dorsal view of entire legs II and III.

TABLE 2. Leg chaetotaxy of larvae of *Fessonia torshizica* n. sp. and *F. papillosa*.

	F. torshizica n. sp.	*F. papillosa*
Palpal Tr	0 N	0 N
Palpal Fe	1 N	1 N
Palpal Ge	1 N	1 N
Palpal Ti	3 N	3 N
Palpal Ta	5 N, 1 ζ, 1 ω	5 N, 1 ζ, 1 ω
Cx I	1 N, 1 elc	1 N, 1 elc
Tr I	1 N	1 N
Bf I	3 N	2 N
Tf I	4 N	5 N
Ge I	8 N, 1 σ	8 N, 1 σ, 1 κ
Ti I	13 N, 3 φ, 1 da, 1 κ, 1 tr	13 N, 3 φ, 1 da, 1 κ, 1 tr
Ta I	26 N, 2 ζ, 1 Z, 1 ω, 1 ε, 1 ta, 1 X, 2 tr	20-22 N, 2 ζ, 1 Z, 1 ω, 1 ε, 1 ta, 1 X, 2 tr
Cx II	1 N	1 N
Tr II	I N	1 N
Bf II	2 N	2 N
Tf II	5 N	5 N
Ge II	8 N, 1 κ, 1 σ	8 N, 1 κ, 1 σ
Ti II	14 N, 2 φ	14 N, 2 φ
Ta II	24 N, 1 ζ, 1 ω	21-22 N, 1 ζ, 1 ω
Cx III	1 N	1 N
Tr III	1 N	1 N
Bf III	1 N	1 N
Tf III	5 N	5 N
Ge III	8 N. 1 σ	8 N
Ti III	14 N, 1 φ	14 N, 1 φ
Ta III	23 N, 1 ζ	21-23 N, 1 ζ

Legs (Figs 4-7). Leg I 208 (172) long, femora I-III divided into basi- and telofemur; segmentation formula: 7-7-7. Details of leg chaetotaxy in Table 2. Trichobothria present on tibia and tarsus of leg I. Anterior trichobothrial sensilum (*ta*) on tarsus I forming a complex with spatulate seta (χ), microsolenidion (ε), eupathidium (ζ) and seta *z*. Two trichobothria also located in proximal half of tarsus I. Tibia I with one trichobothrium in proximal half; shape of all trichobothria on leg I similar, with nude base and setulose upper half. A posterior solenidion on tibia I along with seta *da*. Solenidion (σ) on genu I shorter than 1/2 length of other solenidia on leg I. Leg II 203 (171) long, anterior solenidion on tibia II longer than posterior one. Genu II with only pit of microseta κ present. Solenidion (σ) on genu II subequal to posterior solenidion (φ) of tibia I. Leg III 248 (215) long, solenidion (σ) on genu III a little longer than solenidion (φ) on tibia III. All tarsi I-III with smooth and claw-like empodia; lateral claws pad-like, with small barbs.

REMARKS: *Fessonia torshizica* n. sp. differs from *F. papillosa* in fnBf I (3 *vs* 2), fnTf I (4 *vs* 5), number of microsetae κ on genu I (0 *vs* 1), fnTa I (26 *vs* 20-22), fnTa II (24 *vs* 21-22), number of solenidia on genu III (1 *vs* 0) and fnTa III (23 *vs* 21-23). All leg chaetotaxy characters of the larvae of *Fessonia torshizica* n. sp. and *F. papillosa* are compared in Table 2.

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